

### **REMARKS**

Claims 1-15 and 17-21 and 23-29 are pending. Claims 3-8 and 18-19 stand allowed. Claims 1-2, 9-12, 14-17 and 20-24 stand rejected. Claim 13 stands objected to as being dependent on a rejected base claim. The Office Action Summary (page 1) indicates that claims 1-24 are pending; however, only claims 1-15 and 17-24 were pending at the time of the Office Action, claim 16 having been previously cancelled. Claim 21 is amended, claim 22 is cancelled, and claims 25-29 are added. Claim 25 was added to preserve the scope of the original subject matter of claim 24 before claim 1 was amended. Claims 26 and 28 are added to further limit the subject matter of claims 9 and 17, respectively, by specifying that the first and second center frequencies differ by a predetermined frequency difference. Claim 27 is added, as suggested by Examiner Urban, to claim the subject matter of claim 9 in alternative language by changing "based on a signal" to "using a signal." Claim 29 specifies further features of the invention defined by claim 14.

The applicant thanks examiners Chow and Urban for courtesies extended to the applicant during a December 15, 2005 personal interview. During the interview, it was agreed that the DesJardins patent, alone or in combination with Wilson and Murphy et al., does not disclose the limitations specified in claim 10, and that the DesJardins patent, alone or in combination with Wilson, does not disclose the limitation specified in claim 17. It was also agreed that Murphy et al., even with oscillator 58 replaced by a frequency synthesizer, and even if the frequency synthesizer were to include an oscillator that is read as the claimed "clock source," Murphy et al. in combination with Wilson still does not disclose that a signal from the clock source is provided to, or used in, the circuitry to detect a frequency difference that is specified as included in the processor (read as Murphy's microprocessor 68). In discussing claim 9, examiner Urban suggested that the phrase "based on a signal" be replaced with "using a signal" and the phrase "based on the signal" be replaced with "using the signal" in claim 9. Examiner Urban suggested that this change might render claim 9 unobvious. The applicant disagreed that this change is needed. However, independent claim 27 has been added that incorporates this change, and the applicant will await the next Office Action. The applicant traversed the rejection of

claim 1 on the grounds asserted in the Office Action. However, since prior art, not of record, directed to tunable radio sets based on a computer controlled frequency synthesizer as a local oscillator might be found at a later date, the applicant proposed amending claim 1. The applicant asserted that the invention is distinguished over such tunable radio sets in at least two ways: one way is specified in amended claim 1, and another way is specified in claim 24 (also found in new independent claim 25).

**A. Claims 1-2 And 24 Are Not Unpatentable Under 35 U.S.C. 103(a) As Being Obvious Over Wilson In View Of Morita**

The Office Action rejects claims 1-2, 22 and 24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,816,834 to Wilson in view of U.S. Patent No. 5,355,767 to Morita. Claim 22 is no longer pending. If applicable to amended claims 1-2 and 24, this rejection is respectfully traversed. The Office Action failed to establish a *prima facie* case for the obviousness of claims 2 and 24, as pending at the time of the Office Action, for at least the following reasons.

**1. The Motivation To Combine Asserted In The Office Action Is Traversed**

On page 2, the Office Action admits that “Wilson fails to teach a processor coupled to the rf bridge” (of claim 1). However, on pages 2-3, the Office Action asserts that “it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wilson with Morita’s processor coupled to the oscillator, a pair of mixers, in order to improve the measurement accuracy, by adjusting of the oscillator frequency.”

To the contrary, Wilson in view of Morita does not disclose, teach or suggest any motivation to modify Wilson “in order to improve the measurement accuracy, by adjusting of the oscillator frequency” as asserted in the Office Action. Respectfully, this asserted motivation is absent from the applied art.

In fact, the Morita patent mentions “accuracy” in only two places.

In the first place, in column 2, lines 46-55, the Morita patent states:

When the system is used to aim the cannon for firing of a destructive artillery round at the detected emission site any

distorting effects that cause a variation in the detecting shell trajectory from its calculated position, such as wind shifts and the like, produce a similar distorting effect on the subsequent artillery round and are accordingly largely cancelled. The system thus attains a higher accuracy than it would in merely calculating the position of the emission source.

This reference to accuracy addresses only ballistic accuracy of an artillery shell by canceling error sources common to two successively fired artillery rounds. This paragraph does not address measurement accuracy.

In the second place, in column 4, lines 37-44, the Morita patent states:

The antennae 26 and 28 preferably have conventional doughnut broad-band radiation patterns. The separation of the antennae 26 and 28 along the length of the shell should be as great as possible but must exceed one wavelength of the lowest frequencies to be detected. The accuracy of position detection improves as the number of wavelengths by which the antennae are separated increases.

This reference to accuracy addresses only the baseline separation between antenna 26 and antenna 28. This reference has nothing to do with improving accuracy by using VCO 48 and processor 56 of Morita in place of either oscillator 8 or 18 of the Wilson circuit.

The Office Action's asserted motivation that a person would have been motivated to modify Wilson using the VCO 48 and processor 56 from Morita "in order to improve the measurement accuracy, by adjusting of the oscillator frequency" is simply not supported by evidence. If the Patent Office disagrees with this analysis, the Patent Office is invited to explain the basis of such disagreement in the next responsive Patent Office letter.

## 2. Withdrawal Of The Rejection Of Claim 2 Is Earnestly Solicited

As to the rejection of claim 2, as pending at the time of the Office Action, Wilson in view of Morita does not disclose, teach or suggest "a processor and an RF bridge coupled to the processor to receive a reference signal from the processor" as specified in claim 1, where the third frequency converter provides "a signal that is characterized by a frequency difference modulated onto the reference signal" (emphasis added) as specified in claim 2 at the time of the Office Action, dependent on claim 1.

Morita does not disclose any reason to replace Wilson's low frequency oscillator 18 with Morita's VCO 48 and processor 56, although Morita may be regarded as disclosing a reason to replace Wilson's high frequency oscillator 8 with Morita's VCO 48 and processor 56. This distinction is material.

With respect to the rejection of claim 2 pending at the time of the Office Action, the Office Action on page 3 asserts that "the frequency difference signal [is] modulated onto the a reference signal Ø4" and cites column 2, lines 45-65 as support. It is respectfully submitted that signal Ø4 cannot be read as the reference signal specified in claim 1 at least because there is no motivation to replace Wilson's low frequency oscillator 18 with Morita's VCO 48 and processor 56. Wilson in view of Morita simply does not disclose, teach or suggest any reason why a person would be motivated to modify Wilson to replace Wilson's low frequency oscillator 18 with Morita's VCO 48 and processor 56 "in order to improve the measurement accuracy, by adjusting of the oscillator frequency" as asserted in the Office Action. The teaching of Morita is that VCO 48 and processor 56 might be used to scan a bandwidth. In column 5, lines 32-62, Morita discloses that the VCO 48 and processor 56 are programmed "to scan the band width of interest until a signal is detected" (column 5, lines 47-48). The teaching of this scanning, might be regarded as motivation to use VCO 48 and processor 56 of Morita in place of high frequency oscillator 8 of the Wilson circuit since scanning the output of Wilson's high frequency oscillator 8 would also scan a bandwidth in the Wilson device. In no case can Morita's disclosure be regarded to be motivation to replace Wilson's low frequency oscillator 18 with Morita's VCO 48 and processor 56.

3. Withdrawal Of The Rejection Of Claim 24 Is Earnestly Solicited

As to the rejection of claim 24 (and if applied to new claim 25), Wilson in view of Morita does not disclose, teach or suggest "a processor and an RF bridge coupled to the processor to receive a reference signal from the processor" as specified in claim 1, where "the reference signal is coupled to only one of the first and second frequency converters" as specified in claim 24. As discussed above with respect to the rejection of claim 2, the signal Ø3 from Wilson's high frequency oscillator 8 might be read as the reference signal; however, the signal Ø4 from

Wilson's low frequency oscillator 18 cannot be regarded as the reference signal. The signal Ø3 is coupled directly to Wilson's mixer 4 and indirectly (through beat detector 31, through filter 33 through phase detector 35 and through VCO 16) to mixer 14. Accordingly, Wilson in view of Morita does not disclose, teach or suggest that "the reference signal is coupled to only one of the first and second frequency converters" as specified in claim 24 (and new claim 25). Withdrawal of the rejection of claim 24 is earnestly solicited.

4. Withdrawal Of The Rejection Of Amended Claim 1 Is Earnestly Solicited

Claim 1 has been amended to specify that the reference signal is "characterized by a constant predetermined frequency." As discussed above, Wilson in view of Morita discloses that the output of VCO 48 scans in frequency under control of processor 56, and therefore, cannot be regarded as "characterized by a constant predetermined frequency." Accordingly, amended claim 1, and all claims dependent on claim 1, are not unpatentable as being obvious over Wilson in view of Morita.

**B. Claims 9, 14-15 And 21 Are Not Unpatentable Under 35 U.S.C. 103(a) As Being Obvious Over Wilson In View Of Murphy et al.**

The Office Action rejects claims 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,816,834 to Wilson in view of U.S. Patent No. 5,541,608 to Murphy et al. (hereinafter Murphy). With respect to claims 9 and 14-15, this rejection is respectfully traversed. Claim 21 has been amended. If applicable to claim 21, the rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case for the obviousness of claims 9, 14-15 and 21 for at least the following reasons.

Wilson in view of Murphy does not disclose, teach or suggest a receiver comprising a processor where the processor includes both "a digital frequency source to generate a reference signal based on a signal from a clock source" and "circuitry to detect a frequency difference from the information signal based on the signal from the clock source" as specified in claim 9, and therefore contained in all claims dependent on claim 9.

As discussed in the present specification, the accuracy of the range measurement is dependent on the accuracy of the determination of the frequency difference. To improve accuracy, a processor relies on a single clock source specified in claim 9. The single clock source provides a signal to the digital frequency source that generates the reference signal, and provides the same signal to the circuitry to detect a frequency difference from the information signal. In this way, the difference signal shows up as a perturbation on the information signal that is otherwise at the same frequency as the frequency of the reference signal. Undesired frequency differences between the reference signal and the unperturbed information signal are avoided. Both the claimed “digital frequency source” and the claimed “circuitry to detect” generate and detect their respective signals based on a signal from the clock source.

The Office Action on page 4 admits that “Wilson fails to teach a processor coupled to the rf bridge to receive an information signal from the rf bridge, [and] a digital frequency source to generate a reference signal based on a signal from a clock source.” However, the Office Action on page 4 goes on to assert that “Murphy et al. (Murphy) teaches the microprocessor 68 coupled to the rf bridge via digital control 66 [antennas 30, a pair of mixers 55, freq. discriminator 59, phrase compare 63 in Fig. 7], the microprocessor controls the local synthesizer oscillator 58 for performing the angle measurement [abstract, col. 8, lines 5-27], based on the obvious reference clock source in the synthesizer 68, a synthesizer is obviously comprising a reference clock source for generating oscillator output signal.”

The Office Action is asserting that a reference clock source is an obvious component of a frequency synthesizer of a type that reads on L.O. oscillator 58 of FIG. 7 of Murphy (column 8, lines 11-13). Although, the Office Action fails to support this assertion of obviousness with evidence, this assertion will be regarded as an assertion of Official Notice that frequency synthesizers include a reference clock source.

1. The Office Action is ambiguous in its assertion that “the microprocessor controls the local synthesizer oscillator 58 for performing the angle measurement ... based on the obvious reference clock source in the synthesizer 68.” Perhaps this is just a typing error. Reference numeral 68 of FIG. 7 of Murphy is a microprocessor, not a synthesizer. Although Murphy

discloses at column 8, lines 11-13 that oscillator 58 may be a synthesizer controlled by microprocessor 68, there is no disclosure that erases the distinction between oscillator 58 and microprocessor 68.

2. The disclosure of Murphy only permits microprocessor 68 to provide control signals to a frequency synthesizer located and denoted as numeral 58. This assumes that Murphy's oscillator 58 has been replaced by the frequency synthesizer 58. Murphy does not disclose, teach or suggest that any signals are sent from the frequency synthesizer back to microprocessor 68.

Even if, *arguendo*, Wilson were to be modified to replace its high frequency oscillator 8 with a frequency synthesizer controlled by microprocessor 68 as asserted to be disclosed in Murphy, Wilson in view of Murphy still would not disclose, teach or suggest a receiver comprising a processor, where the processor includes both:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9. Wilson in view of Murphy simply has no means to provide the reference signal to microprocessor 68.

Microprocessor 68 has no disclosed means for receiving the reference signal from Murphy's frequency synthesizer 58, and therefore, microprocessor 68 has no means to detect the claimed frequency difference "based on the signal from the clock source" as specified in claim 9. At least because the Office Action asserts, by Official Notice, that the frequency synthesizer [to be read as Murphy's oscillator 58] includes "a reference clock source" to be read as the claimed "clock source," the claimed "circuitry to detect a frequency difference from the information signal" cannot be regarded as being "based on the signal from the clock source" as specified in claim 9 and therefore contained in all claims dependent on claim 9.

The Office Action on pages 4-5 concludes that "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wilson with Murphy's reference

clock source in the synthesizer controlled by microprocessor 68, in order to control the oscillator frequency sent to a pair of frequency converters.” Even if true, *arguendo*, the Office Action still fails to establish a *prima facie* case that claims 9, 14-15 and 21 would have been obvious over Wilson in view of Murphy for at least the reasons discussed above.

3. Even if Murphy’s oscillator 58 were to be replaced by a frequency synthesizer that includes a clock source, Wilson in view of Murphy still would not disclose, teach or suggest a receiver comprising a processor, where the processor includes:

circuitry to detect a frequency difference from the information signal based on the signal from the clock source (emphasis added)

as specified in claim 9, and therefore contained in all claims dependent on claim 9.

The Office Action, on page 4, admits that Wilson does not teach a processor coupled to an rf bridge to receive an information signal, but asserts that Murphy teaches this feature. The Office Action reads Murphy’s microprocessor 68 on the claimed processor, and therefore, the circuitry to detect must be a portion of microprocessor 68. However, the Office Action, on page 4, also asserts that “microprocessor 68 [is] coupled to the rf bridge via digital control 66 [antennas 30 a pair of mixers 55, freq. discriminator 59, phase compare 63 in Fig. 7].”

First, it is noted that frequency discriminator 59 may be regarded as “circuitry to detect a frequency difference from the information signal.” However, frequency discriminator 59 does not operate “based on the signal from the clock source.” The Office Action asserts that the clock source is a part of frequency synthesizer 58.

Second, frequency discriminator 59 is not a portion of microprocessor 68 that the Office Action regards to be the claimed processor. Claim 9 specifies that the claimed processor includes “circuitry to detect a frequency difference from the information signal.”

Third, there is no disclosed means by which microprocessor 68 can detect a frequency difference from any signal from digital control circuit 66 to microprocessor 68 based on the signal from the clock source as specified in claim 9, and therefore contained in all claims



dependent thereon. Murphy discloses only a means for measuring a phase angle (see column 8, line 57 through column 9, line 28, or alternatively, column 9, line 29 through column 10, line 52).

**C. Claims 10-11 Are Not Unpatentable Under 35 U.S.C. 103(a) As Being Obvious Over Wilson In View Of Murphy et al. And Further In View Of DesJardins**

The Office Action rejects claims 10-11 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,816,834 to Wilson in view of U.S. Patent No. 5,541,608 to Murphy et al. and further in view of U.S. Patent No. 5,570,099 to DesJardins. This rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case for the obviousness of claims 10-11 for at least the following reasons.

1. As to the rejection of claims 10-11 and as discussed above with respect to the rejection of claims 9, 14-15 and 21, Wilson in view of Murphy does not disclose, teach or suggest a receiver comprising a processor, where the processor includes

circuitry to detect a frequency difference from the information  
signal based on the signal from the clock source

as specified in claim 9, and therefore contained in claims 10 and 11, dependent on claim 9. The addition of DesJardins to the applied art does not disclose, teach or suggest the missing elements specified in claim 9.

2. In addition to the above, the Office Action fails to establish a *prima facie* case for the obviousness of claims 10 and 11 at least because Wilson in view of Murphy and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes "circuitry to detect" where the circuitry to detect includes:

a first Fourier transformer having a first center frequency; and

a second Fourier transformer having a second center frequency,

as specified in claim 10, and therefore contained in all claims dependent on claim 10.

The Office Action, on page 6, admits “Wilson and Murphy fail to teach [sic.] the circuitry to detect includes a first fourier transformer having a first [center] frequency and a second fourier transformer having a second center frequency, the first center frequency being different than the second center frequency.” But then on page 6, the Office Action asserts that “DesJardins teaches these features, the first, second, fourier transforms 18, 34, for respective first, second, center frequency associated with the different center frequencies of each Filters 20, 36, for determining of the transmitter location from two antenna signals (abstract, Fig. 1-3, col. 3, lines 35-59, col. 2, line 65 to col. 3, line 25, col. 5, lines 37-45).” The erroneous assertion that DesJardins teaches these features is respectfully traversed.

As discussed during the December 15, 2005 personal interview, Hilbert transforms are not Fourier Transforms. Even though the Office Action, on page 6, asserts that “DesJardins teaches these features, the first, second, fourier transforms 18, 34,” it was agreed at the interview that the transforms 18, 34 in DesJardins denote Hilbert transforms and not Fourier transformers. DesJardins discloses that the Hilbert transformation transforms the real sampled signal into a complex baseband signal sampled at one half the real sample rate (see column 1, lines 50-54). This is not a description of a Fourier transform.

**D. Claim 12 Is Not Unpatentable Under 35 U.S.C. 103(a) As Being Obvious Over Wilson In View Of Murphy et al. And DesJardins And Further In View Of Maitre.**

The Office Action rejects claim 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,816,834 to Wilson in view of U.S. Patent No. 5,541,608 to Murphy et al. and U.S. Patent No. 5,570,099 to DesJardins and further in view of U.S. Patent No. 4,903,030 to Maitre. This rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case for the obviousness of claim 12 for at least the following reasons.

1. As to the rejection of claim 12 and as discussed above with respect to the rejection of claims 9, 14-15 and 21, Wilson in view of Murphy does not disclose, teach or suggest a receiver comprising a processor, where the processor includes

circuitry to detect a frequency difference from the information  
signal based on the signal from the clock source

as specified in claim 9, and therefore contained in claim 12, dependent on claim 9. Furthermore, the addition of DesJardins and Maitre to the applied art does not disclose, teach or suggest this missing element specified in claim 9.

2. In addition, claim 12 is dependent on claim 10. For at least all of the reasons discussed above with respect to the rejection of claim 10, Wilson in view of Murphy and DesJardins does not disclose all of the limitation specified in claim 10. The inclusion of Maitre in the applied art, does disclose all of the missing limitations. Wilson in view of Murphy and DesJardins and further in view of Maitre does not disclose all of the limitation specified in claim 10, and therefore contained in claim 12, dependent on claim 10.

Accordingly, withdrawal of the rejection of claim 12 under 35 U.S.C. §103(a) as being obvious over Wilson in view of Murphy and DesJardins and further in view of Maitre. is earnestly solicited.

**E. Claims 17, 20 And 23 Are Not Unpatentable Under 35 U.S.C. 103(a) As Being Obvious Over Wilson In View Of DesJardins**

The Office Action rejects claims 17, 20 and 23 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,816,834 to Wilson in view of U.S. Patent No. 5,570,099 to DesJardins. This rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case for the obviousness of claims 17, 20 and 23 for at least the following reasons.

1. As to claims 17, 20 and 23 and as discussed above with respect to claim 10, Hilbert transforms are not Fourier transformers as specified in claim 17, and therefore contained in claims 20 and 23, dependent on claim 17. Although the Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins read on the first and second Fourier transforms specified in claim 17, it was agreed at the December 15, 2005 personal interview that Hilbert transforms are not Fourier Transforms.

Accordingly, withdrawal of the rejection of claims 17, 20 and 23 under 35 U.S.C. §103(a) as being obvious over Wilson in view of DesJardins is earnestly solicited.

**F. Claim 13 Is In Proper Form For Allowance**

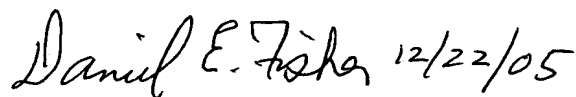
The Office Action objects claim 13 as being dependent upon a rejected base claim. Claim 13 is dependent on claim 10. The implied assertion that claim 10 is properly rejected is respectfully traversed for at least the reasons discussed above with respect to the rejection of claim 10. Upon reconsideration of claim 10 and a finding of the patentability of claim 10, claim 13 is in condition for allowance. Withdrawal of the objection to claim 13 is earnestly solicited.

**CONCLUSION**

By traversing all of the above rejections based on the specific remarks discussed above, I do not intend to imply that other grounds do not exist for traversing any or all rejections or objections.

In view of the present amendments and remarks, withdrawal of the rejections of the claims is earnestly solicited. It is respectfully submitted that the present application is in condition for allowance. Prompt reconsideration and allowance of the application are earnestly solicited. Should the examiner believe that any further action is necessary to place the application in condition for allowance, the examiner is invited to contact the undersigned applicant at the telephone number listed below. Furthermore, please note the change of address and telephone number.

Respectfully submitted,

 12/22/05

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Daniel E. Fisher

Telephone: 703-542-2399  
Address 40452 Hickory Ridge Place  
Aldie, VA 20105